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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/534,177

02/07/2006

Soichi Kuwahara

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9986

26263 7590 08/15/2007
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EXAMINER

ZIMMERMANN, JOHN P

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

08/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,177

Applicant(s)

KUWAHARA ET AL.

Examiner

John P. Zimmermann

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 05 May 2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 2861

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statement filed 05 May 2005 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the IDS has an additional page with references that have not been supplied, the attorney's docket number is different, and it appears to have been inadvertently added to the file. Therefore the documents listed on that page have been crossed off and have not been considered. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. If the documents listed thereon were intended to have been considered for this application, applicant is required to submit the required references and further advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Drawings

3. Figure 11b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: #A (Figure 2) & #R1, #R2 (Figure 6). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The abstract of the disclosure is objected to because it currently is longer than 25 lines and contains more than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 2861

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. **Claims 2-4 & 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kobayashi et al.**, (US 6,527,375 B2) from this point on referred to as “**Kobayashi et al. B2**” in view of **Kobayashi et al.**, (JP 11-207963 A) from this point on referred to as “**Kobayashi et al. A**”.

a. As related to independent **claim 2**, Kobayashi et al. B2 teach a printing apparatus comprising a head including a plurality of ink discharging portions (Kobayashi et al. B2 – Figure 1, Reference #103 & #107, shown below) provided in a juxtaposed relationship thereon (Kobayashi et al. B2 – Figure 3a & 3b, shown below) and capable of deflecting a discharging direction of an ink droplet (Kobayashi et al. B2 – Figure 5, Reference #A3, shown below) to be discharged from each of said ink discharging portions to a plurality of directions in the juxtaposition direction of said ink discharging portions (Kobayashi et al. B2 – Figure 3, notably “x” direction & Figure 6, Reference #C, shown below).

FIG. 1

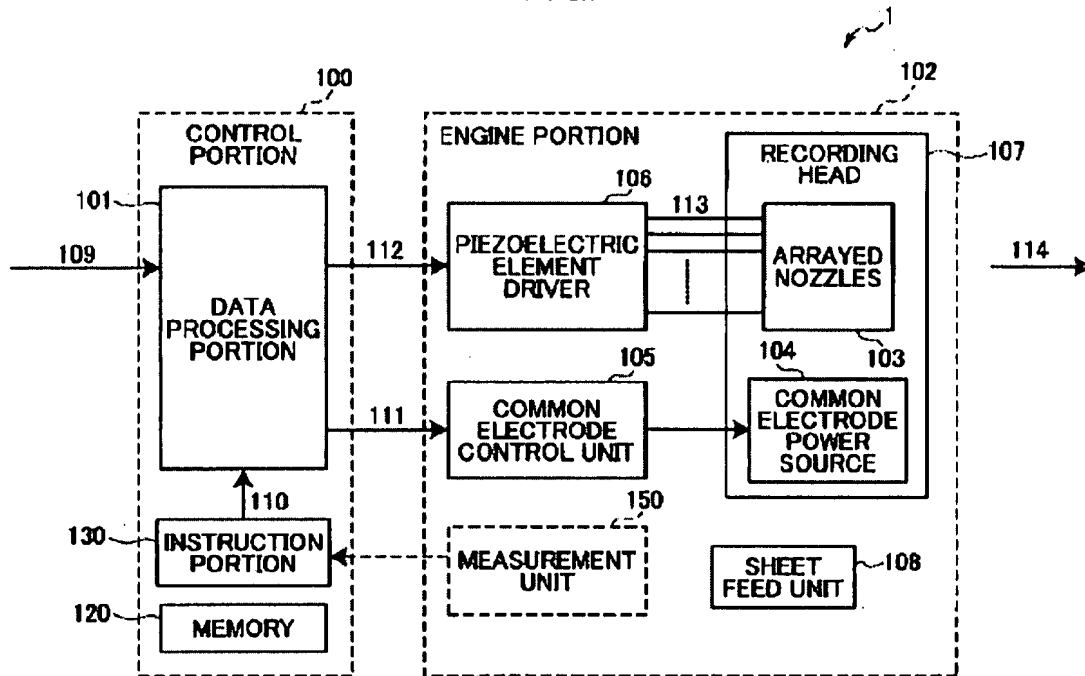


FIG. 3(a)

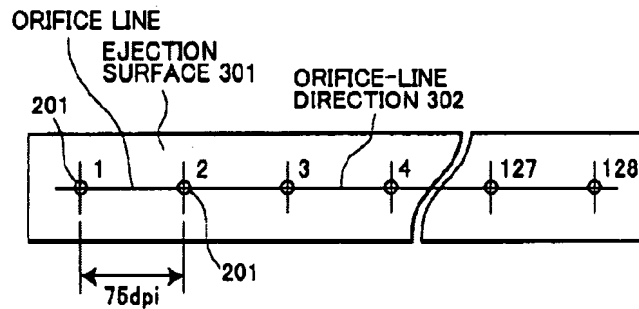


FIG. 3(b)

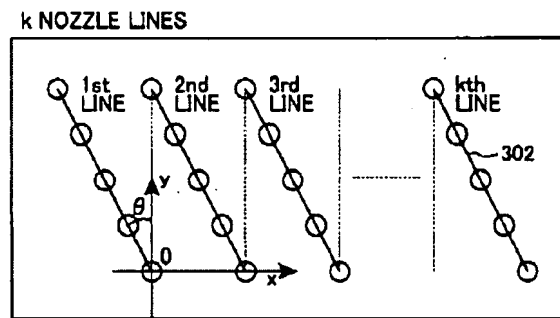
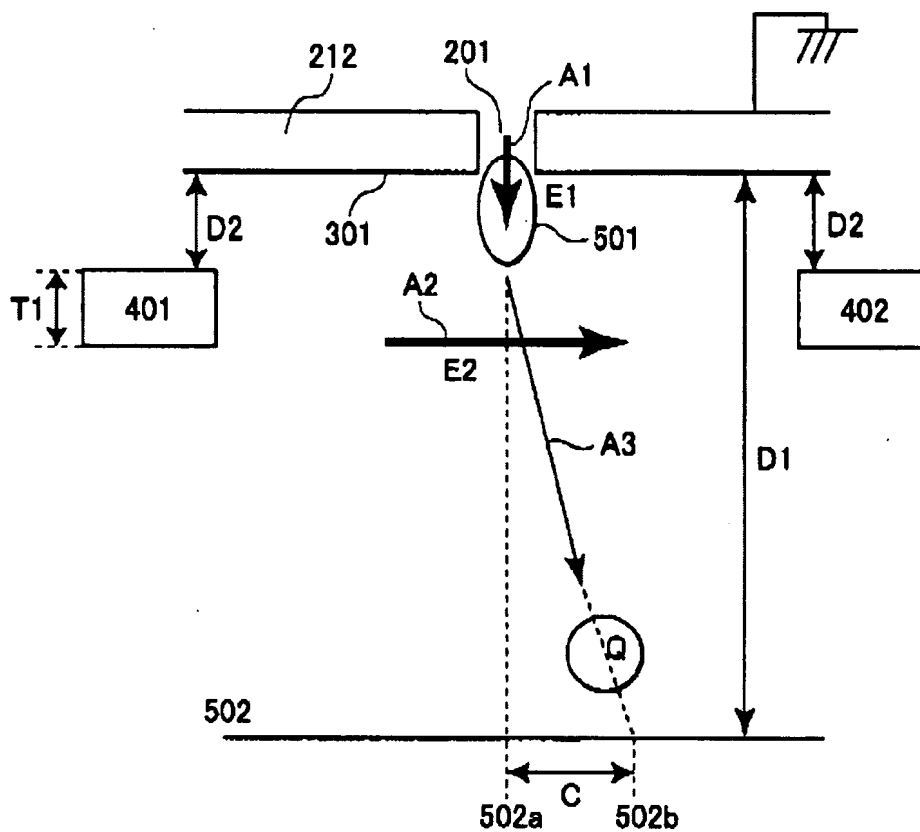
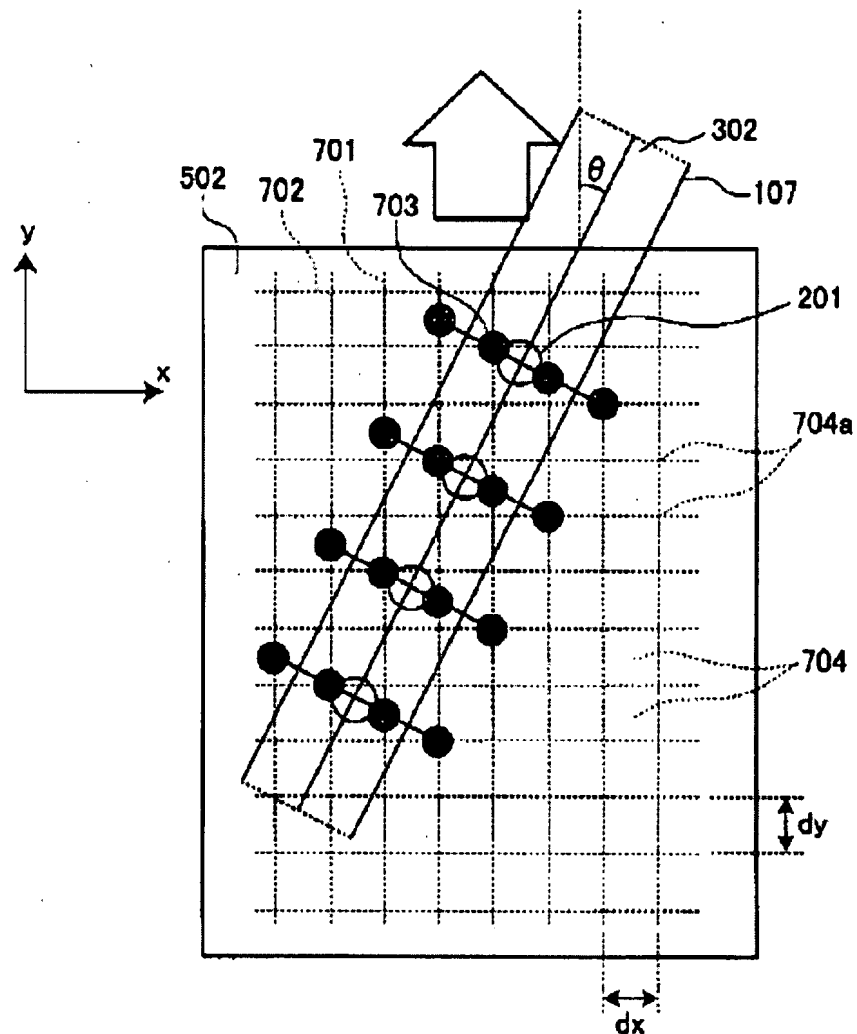


FIG. 5**FIG. 6**

ELECTRIC VOLTAGE V_{chg} (V)	DEFLECTION AMOUNT c (μm)	AVERAGE SPEED V_{av} (m/sec)
200	187	2.45
100	94	2.49
0	0	2.46
-100	-94	2.38
-200	-187	2.42

Art Unit: 2861

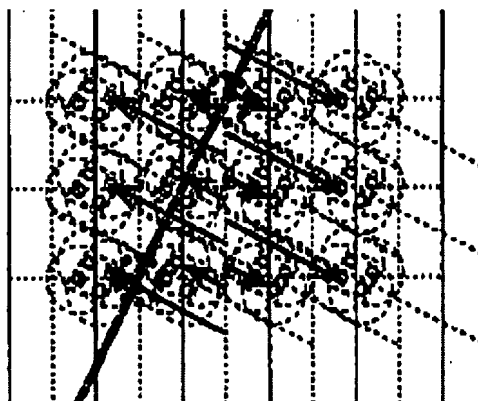
- b. Continuing with **claim 2**, Kobayashi et al. B2 teach the printing apparatus capable of setting the discharging deflection angle which is a maximum deflection amount of an ink droplet to be discharged from said ink discharging portions to a plurality of angles (Kobayashi et al. B2 – Figure 7, Reference #201 & #703, shown below).

FIG. 7

- c. Continuing with **claim 2**, Kobayashi et al. B2 teach a printing resolution is determined in response to inputted print data from between or among a plurality of

Art Unit: 2861

printing resolutions which are determined from a juxtaposition distance of said ink discharging portions, the discharging deflection angle of an ink droplet to be discharged from said ink discharging portions and a plurality of directions in which an ink droplet can be discharged from said ink discharging portions (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 20-24 & 34-43 and Figure 1, Reference #101, #110, #111, #112, #120, & #130, shown previously). Additionally, Kobayashi et al. B2 teach the ink discharging portions from which an ink droplet is to be discharged and the discharging deflection angle of an ink droplet to be discharged from said ink discharging portions are selected based on the determined printing resolution and the discharging direction of one or two or more ink droplets from the selected ink discharging portions on one line is determined and a discharge execution signal with which the discharging direction of an ink droplet can be specified is transmitted to each of the selected ink discharging portions to execute printing with the printing resolution determined in response to the inputted print data from between or among the plurality of printing resolutions (Kobayashi et al. B2 – Preferred Embodiment, Column 10, Lines 50-57 and Figure 13(b), shown below).

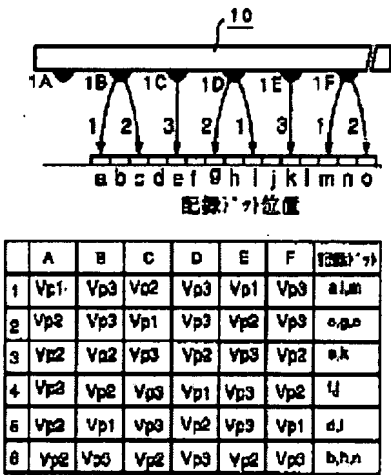
FIG.13(b)

d. Continuing with **claim 2**, while Kobayashi et al. B2 teach making the discharging deflection angle variable in order to further increase the width of the resolution (Kobayashi et al. B2 – Figure 7, shown previously and Figure 11, shown below), the specific resolutions *are not* detailed. *However*, Kobayashi et al. A teach controlling the ink discharging direction to print with a plurality of resolutions and details the plurality of resolutions specifically (Kobayashi et al. A – Abstract and Figures 6 & 7, shown below).

【図7】

【図7】

【図6】



記録ヘッド形状	ヘッド中心間隔(μm)	解像度(dpi)	記録速度(mm/sec)
	28	900	9.3
	40	636	9.3
	58	450	9.3
	80	318	9.3
	85	300	18.7
	120	212	18.7

e. As related to independent **claim 8**, Kobayashi et al. B2 teach a printing method in which a head including a plurality of ink discharging portions (Kobayashi et al. B2 –

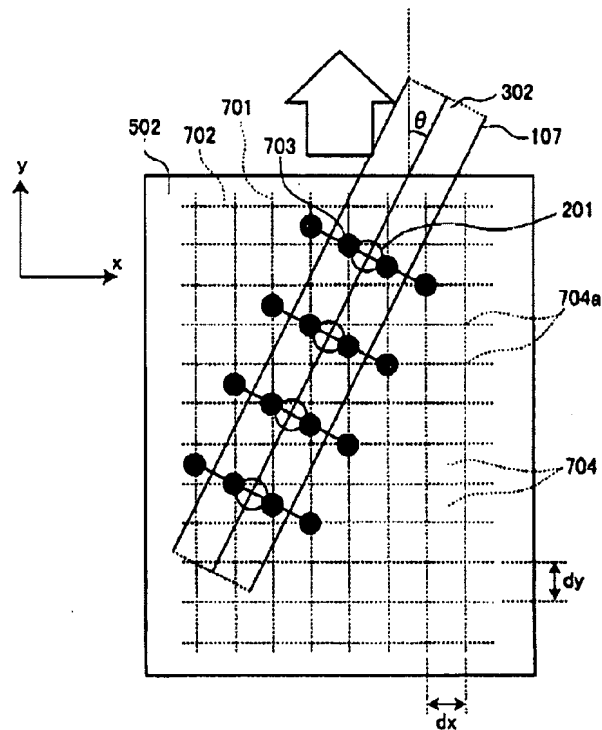
Art Unit: 2861

Abstract and Figure 1, Reference #103 & #107, shown previously) provided in a juxtaposed relationship thereon is used (Kobayashi et al. B2 – Figure 3a & 3b, shown previously). Kobayashi et al. B2 also teach a discharging direction of an ink droplet to be discharged from each of said ink discharging portions can be deflected to a plurality of directions (Kobayashi et al. B2 – Figure 5, Reference #A3, shown previously) in the juxtaposition direction of said ink discharging portions (Kobayashi et al. B2 – Figure 3, notably “x” direction, shown previously & Figure 6, Reference #C, shown below) and additionally the discharging deflection angle which is a maximum deflection amount of an ink droplet to be discharged from said ink discharging portions can be set to a plurality of angles (Kobayashi et al. B2 – Figure 7, Reference #201 & #703, shown below).

FIG. 6

ELECTRIC VOLTAGE V_{chg} (V)	DEFLECTION AMOUNT c (μm)	AVERAGE SPEED V_{av} (m/sec)
200	187	2.45
100	94	2.49
0	0	2.46
-100	-94	2.38
-200	-187	2.42

FIG. 7



f. Continuing with **claim 8**, Kobayashi et al. B2 teach a printing resolution is determined in response to inputted print data from between or among a plurality of printing resolutions which are determined from a juxtaposition distance of said ink discharging portions, the discharging deflection angle of an ink droplet to be discharged from said ink discharging portions and a plurality of directions in which an ink droplet can be discharged from said ink discharging portions (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 20-24 & 34-43 and Figure 1, Reference #101, #110, #111, #112, #120, & #130, shown previously). Additionally, Kobayashi et al. B2 teach the ink discharging portions from which an ink droplet is to be discharged and the discharging deflection angle of an ink droplet to be discharged from said ink discharging portions are selected based on the determined printing resolution and the discharging direction of one

Art Unit: 2861

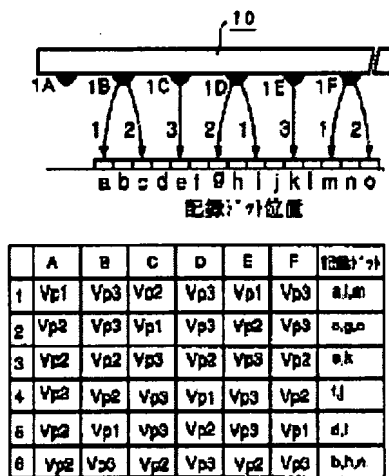
or two or more ink droplets from the selected ink discharging portions on one line is determined and a discharge execution signal with which the discharging direction of an ink droplet can be specified is transmitted to each of the selected ink discharging portions to execute printing with the printing resolution determined in response to the inputted print data from between or among the plurality of printing resolutions (Kobayashi et al. B2 – Preferred Embodiment, Column 10, Lines 50-57 and Figure 13(b), shown previously). While Kobayashi et al. B2 teach making the discharging deflection angle variable in order to further increase the width of the resolution (Kobayashi et al. B2 – Figure 7, shown previously and Figure 11, shown below), the specific resolutions *are not* detailed. *However*, Kobayashi et al. A teach controlling the ink discharging direction to print with a plurality of resolutions and details the plurality of resolutions specifically (Kobayashi et al. A – Abstract and Figures 6 & 7, shown below).

Art Unit: 2861

【図7】

【図7】

【図6】



記録ヘッド形状	記録ヘッド中心間隔(μm)	解像度(dpi)	記録速度(mm/sec)
	28	900	9.3
	40	636	9.3
	56	450	9.3
	80	318	9.3
	85	300	18.7
	120	212	18.7

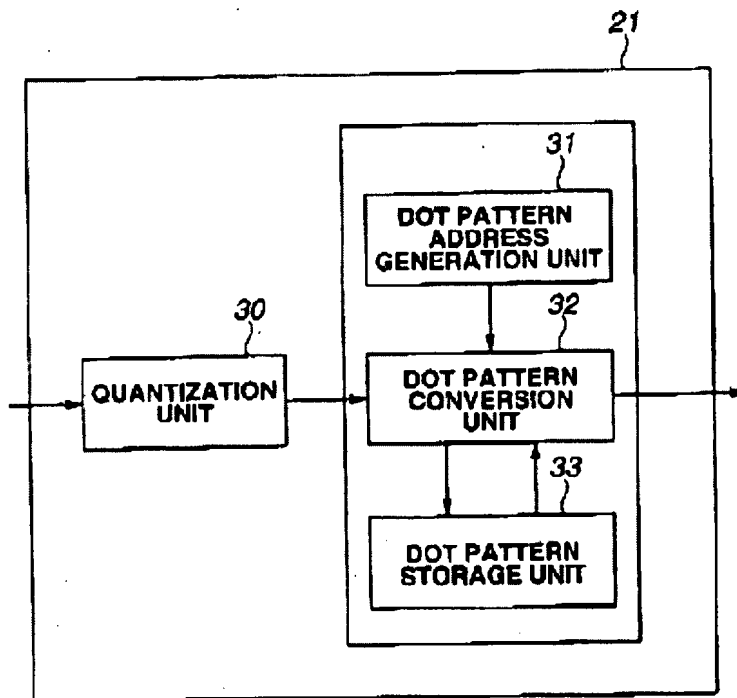
Given the same field of endeavor, specifically an inkjet image forming apparatus with deflection control of ink droplets and applicable printing method, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording device comprising a head including a plurality of ink discharging portions with controls for adjusting the resolution of the printed image by controlling the landing position of the ink droplets and applicable printing method (Kobayashi et al. – Abstract) as taught by Kobayashi et al. B2 with the ink-jet recording apparatus having the ability to print a plurality of specific resolutions by adjusting the deflection of the ink droplets as taught by Kobayashi et al. A in an effort to enhance the image formation and allow recording of fine high-resolution images (Kobayashi et al. A – Abstract). The similarities of the field of endeavor and motivation to combine are further

exemplified by the International Preliminary Examination Report, which details the obviousness of the present invention with regards to Kobayashi et al. A (PCT/IEA/409 – Block V., Sub-Block 2.)

- g. As related to dependent **claim 3**, the previous combination of Kobayashi et al. B2 and Kobayashi et al. A remains as applied to **claim 2**, additionally Kobayashi et al. B2 teach printing resolutions of said printing apparatus corresponding to inputted print data are determined in advance [i.e. stored in the memory], and a printing resolution is determined in response to the inputted print data [i.e. selected program] based on the determination (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 35-41 and Figure 1, Reference #110, #120, & #130, shown previously).
- h. As related to dependent **claim 4**, the previous combination of Kobayashi et al. B2 and Kobayashi et al. A remains as applied to **claim 2**, additionally Kobayashi et al. B2 teach the resolution of the inputted print data is M [i.e. selected program], if said printing apparatus has $M \times n$ (n being a natural number) or $M \times 1/n$ as a printing resolution with which said printing apparatus can print, then the printing resolution is determined to $M \times n$ or $M \times 1/n$ (Kobayashi et al. B2 – Preferred Embodiment, Column 4, Lines 35-41; Column 6, Lines 1-10; Column 12, Lines 62-67 and Figure 1, Reference #110, #120, & #130, shown previously).
10. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kobayashi et al.**, (US 6,527,375 B2) from this point on referred to as “**Kobayashi et al. B2**” and **Kobayashi et al.**, (JP 11-207963 A) from this point on referred to as “**Kobayashi et al. A**” as applied to **claim 2** above, and further in view of **Ogasahara et al.**, (US 2003/0030824 A1).

Art Unit: 2861

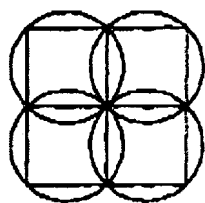
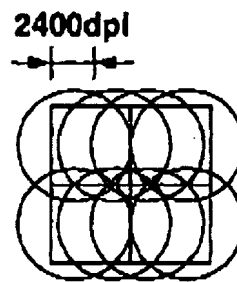
a. As related to dependent **claim 5**, the previous combination of Kobayashi et al. B2 and Kobayashi et al. A remains as applied above, but *does not* specifically teach inputted print data includes information of a resolution or a number of pixels together with information of a print size. *However*, Ogasahara et al. teach an image printing apparatus (Ogasahara et al. – Title) where the inputted print data includes information of a resolution or a number of pixels (Ogasahara et al. – Abstract) together with information of a print size, the printing resolution is determined based on the information of the print size and the resolution or the information of the print size and the number of pixels (Ogasahara et al. – Summary, Paragraphs 18 & 158 and Figure 17, shown below).

FIG.17

b. As related to dependent **claim 6**, the previous combination of Kobayashi et al. B2 and Kobayashi et al. A remains as applied above, but *does not* specifically teach two

Art Unit: 2861

different printing resolutions. *However*, Ogasahara et al. teach part of the inputted print data is determined to a first printing resolution and the other part of the inputted print data is determined to a second printing resolution different from the first printing resolution [i.e. different color tones without decrease in image quality] (Ogasahara et al. – Summary, Paragraphs 17, 167, & 177 and Figures 21A & 21B, shown below).

FIG.21A**Cyan/Magenta/Yellow/Black****FIG.21B****Light Cyan/Light Magenta**

Given the same field of endeavor, specifically an inkjet image forming apparatus with multiple output resolutions, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording device comprising a head including a plurality of ink discharging portions with controls for adjusting the resolution of the printed image with the ability to print a plurality of specific resolutions by adjusting the deflection of the ink droplets as taught by the combination of Kobayashi et al. B2 and Kobayashi et al. A with the ink-jet recording apparatus with the ability to print a plurality of dot arrangement patterns specifically those of different resolutions as taught by Ogasahara et al. in an effort produce a high-quality image having excellent gradation while reducing the cost of the apparatus and

Art Unit: 2861

increasing data processing speed (Ogasahara et al. – Abstract and Background, Paragraph 16).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Iwata et al. (US 4,973,499 A) teach giving information signals to the deflecting electrodes while the ink withdrawn flies between the deflecting electrodes. Tsuruoka (US 6,371,588 B1) teaches printing by dividing a plurality of printing elements (this is selecting ink discharging portions) and time-divisionally driving (changing the discharge direction) the plurality of elements. Ninomiya (US 6,402,292 B1) teaches preliminary discharge of the ink droplet changes the angle of the ink drop discharge with respect to the medium. Lee et al. (US 6,536,873 B1) teach drop on demand ink jet printer with directional control of drop ejection so ink drops are redirected to print at locations normally printed by other orifices. Yamada et al. (US 2003/0058289 A1) teach an inkjet printer with separate devices on either side of ejection hole to vary deflection angle. Yamada et al. (US 2003/0179264 A1) teach an inkjet recording device where the ink droplet ejected and deflected as needed. Hawkins et al. (US 2003/0202053 A1) teach an inkjet printer with two heater elements that can be controlled independently to selectively deflect droplets of ink. Tang et al. (US 2003/0234836 A1) teach an inkjet printer with controlling heaters and a method of setting deflection of an ink drop by applying a properly timed electrical pulse. Takeda et al. (JP 2004-306417 A) teach an inkjet printhead that deflects the route of the ink droplet discharged from a plurality of ink discharge nozzle.

Art Unit: 2861

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is 571-270-3049.

The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPZ

JPZ



MATTHEW LUU
SUPERVISORY PATENT EXAMINER